



STF2222A

SMALL SIGNAL NPN TRANSISTOR

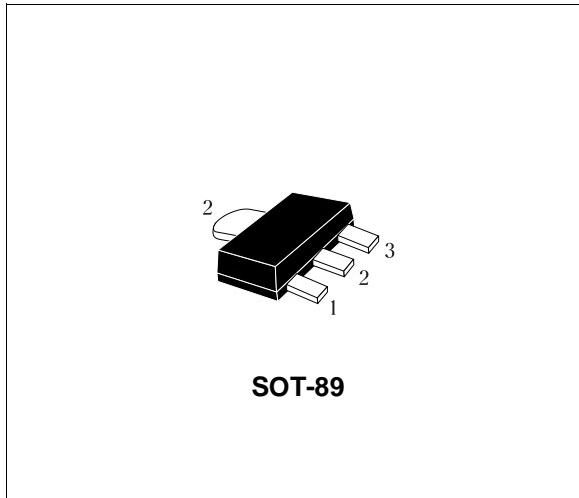
PRELIMINARY DATA

Type	Marking
STF2222A	20F

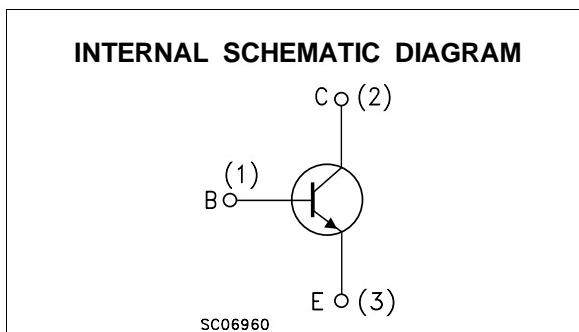
- SILICON EPITAXIAL PLANAR NPN TRANSISTOR
- MINIATURE SOT-89 PLASTIC PACKAGE FOR SURFACE MOUNTING CIRCUITS
- TAPE & REEL PACKING
- THE PNP COMPLEMENTARY TYPE IS STF2907A

APPLICATIONS

- WELL SUITABLE FOR PORTABLE EQUIPMENT
- SMALL LOAD SWITCH TRANSISTOR WITH HIGH GAIN AND LOW SATURATION VOLTAGE



SOT-89



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Emitter Voltage ($I_E = 0$)	75	V
V_{CEO}	Collector-Emitter Voltage ($I_B = 0$)	40	V
V_{EBO}	Emitter-Base Voltage ($I_C = 0$)	6	V
I_C	Collector Current	0.6	A
I_{CM}	Collector Peak Current ($t_p < 5 \text{ ms}$)	0.8	A
P_{tot}	Total Dissipation at $T_{\text{amb}} = 25^\circ\text{C}$	1.2	W
T_{stg}	Storage Temperature	-65 to 150	$^\circ\text{C}$
T_j	Max. Operating Junction Temperature	150	$^\circ\text{C}$

STF2222A

THERMAL DATA

$R_{\text{thj-amb}}$ •	Thermal Resistance Junction-Ambient	Max	104.1	$^{\circ}\text{C/W}$
• Device mounted on a PCB area of 1 cm ² .				

ELECTRICAL CHARACTERISTICS ($T_{\text{case}} = 25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CEX}	Collector Cut-off Current ($V_{\text{BE}} = -3\text{ V}$)	$V_{\text{CE}} = 60\text{ V}$			10	nA
I_{BEX}	Base Cut-off Current ($V_{\text{BE}} = -3\text{ V}$)	$V_{\text{CE}} = 60\text{ V}$			20	nA
I_{CBO}	Collector Cut-off Current ($I_{\text{E}} = 0$)	$V_{\text{CB}} = 75\text{ V}$ $V_{\text{CB}} = 75\text{ V}$ $T_j = 150^{\circ}\text{C}$			10 10	nA μA
I_{EBO}	Emitter Cut-off Current ($I_{\text{C}} = 0$)	$V_{\text{EB}} = 3\text{ V}$			15	nA
$V_{(\text{BR})\text{CEO}}^*$	Collector-Emitter Breakdown Voltage ($I_{\text{B}} = 0$)	$I_{\text{C}} = 10\text{ mA}$	40			V
$V_{(\text{BR})\text{CBO}}$	Collector-Base Breakdown Voltage ($I_{\text{E}} = 0$)	$I_{\text{C}} = 10\text{ }\mu\text{A}$	75			V
$V_{(\text{BR})\text{EBO}}$	Emitter-Base Breakdown Voltage ($I_{\text{C}} = 0$)	$I_{\text{E}} = 10\text{ }\mu\text{A}$	6			V
$V_{\text{CE}(\text{sat})}^*$	Collector-Emitter Saturation Voltage	$I_{\text{C}} = 150\text{ mA}$ $I_{\text{B}} = 15\text{ mA}$ $I_{\text{C}} = 500\text{ mA}$ $I_{\text{B}} = 50\text{ mA}$			0.3 1	V V
$V_{\text{BE}(\text{sat})}^*$	Collector-Base Saturation Voltage	$I_{\text{C}} = 150\text{ mA}$ $I_{\text{B}} = 15\text{ mA}$ $I_{\text{C}} = 500\text{ mA}$ $I_{\text{B}} = 50\text{ mA}$	0.6		1.2 2	V V
h_{FE}^*	DC Current Gain	$I_{\text{C}} = 0.1\text{ mA}$ $V_{\text{CE}} = 10\text{ V}$ $I_{\text{C}} = 1\text{ mA}$ $V_{\text{CE}} = 10\text{ V}$ $I_{\text{C}} = 10\text{ mA}$ $V_{\text{CE}} = 10\text{ V}$ $I_{\text{C}} = 150\text{ mA}$ $V_{\text{CE}} = 10\text{ V}$ $I_{\text{C}} = 150\text{ mA}$ $V_{\text{CE}} = 1\text{ V}$ $I_{\text{C}} = 500\text{ mA}$ $V_{\text{CE}} = 10\text{ V}$	35 50 75 100 50 40		300	
f_T	Transition Frequency	$I_{\text{C}} = 20\text{ mA}$ $V_{\text{CE}} = 20\text{V}$ $f = 100\text{MHz}$		270		MHz
C_{CBO}	Collector-Base Capacitance	$I_{\text{E}} = 0$ $V_{\text{CB}} = 10\text{ V}$ $f = 1\text{ MHz}$		4	8	pF
C_{EBO}	Emitter-Base Capacitance	$I_{\text{C}} = 0$ $V_{\text{EB}} = 0.5\text{ V}$ $f = 1\text{MHz}$		20	25	pF
NF	Noise Figure	$I_{\text{C}} = 0.1\text{ mA}$ $V_{\text{CE}} = 10\text{ V}$ $f = 1\text{ KHz}$ $\Delta f = 200\text{ Hz}$ $R_G = 1\text{ K}\Omega$		4		dB
h_{ie}^*	Input Impedance	$V_{\text{CE}} = 10\text{ V}$ $I_{\text{C}} = 1\text{ mA}$ $f = 1\text{ KHz}$ $V_{\text{CE}} = 10\text{ V}$ $I_{\text{C}} = 10\text{ mA}$ $f = 1\text{ KHz}$	2 0.25		8 1.25	$\text{K}\Omega$ $\text{K}\Omega$
h_{re}^*	Reverse Voltage Ratio	$V_{\text{CE}} = 10\text{ V}$ $I_{\text{C}} = 1\text{ mA}$ $f = 1\text{ KHz}$ $V_{\text{CE}} = 10\text{ V}$ $I_{\text{C}} = 10\text{ mA}$ $f = 1\text{ KHz}$			8 4	10^{-4} 10^{-4}
h_{fe}^*	Small Signal Current Gain	$V_{\text{CE}} = 10\text{ V}$ $I_{\text{C}} = 1\text{ mA}$ $f = 1\text{ KHz}$ $V_{\text{CE}} = 10\text{ V}$ $I_{\text{C}} = 10\text{ mA}$ $f = 1\text{ KHz}$	50 75		300 375	
h_{oe}^*	Output Admittance	$V_{\text{CE}} = 10\text{ V}$ $I_{\text{C}} = 1\text{ mA}$ $f = 1\text{ KHz}$ $V_{\text{CE}} = 10\text{ V}$ $I_{\text{C}} = 10\text{ mA}$ $f = 1\text{ KHz}$	5 25		35 200	μS μS

* Pulsed: Pulse duration = 300 μs , duty cycle $\leq 2\%$

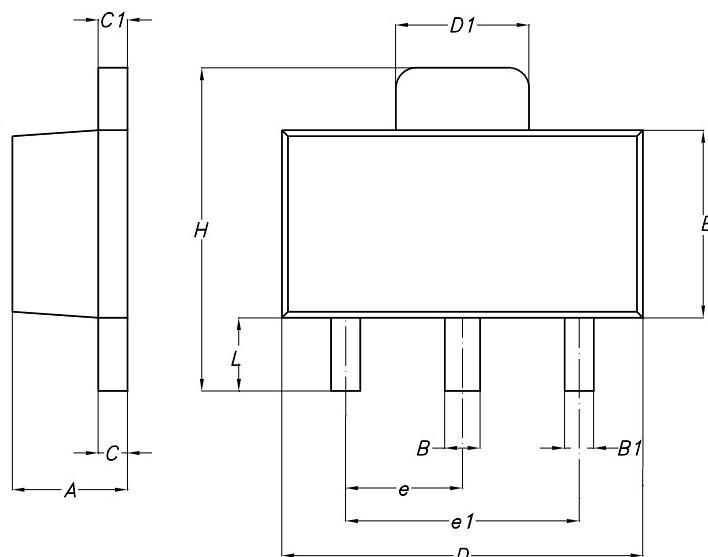
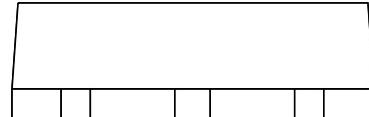
ELECTRICAL CHARACTERISTICS (Continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t_d	Delay Time	$I_C = 150 \text{ mA}$ $I_B = 15 \text{ mA}$ $V_{CC} = 30 \text{ V}$		5	10	ns
t_r	Rise Time			12	25	ns
t_s	Storage Time	$I_C = 150 \text{ mA}$ $I_{B1} = -I_{B2} = 15 \text{ mA}$ $V_{CC} = 30 \text{ V}$		185	225	ns
t_f	Fall Time			24	60	ns

* Pulsed: Pulse duration = 300 μs , duty cycle $\leq 2 \%$

SOT-89 MECHANICAL DATA						
DIM.	mm			mils		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	1.4		1.6	55.1		63.0
B	0.44		0.56	17.3		22.0
B1	0.36		0.48	14.2		18.9
C	0.35		0.44	13.8		17.3
C1	0.35		0.44	13.8		17.3
D	4.4		4.6	173.2		181.1
D1	1.62		1.83	63.8		72.0
E	2.29		2.6	90.2		102.4
e	1.42		1.57	55.9		61.8
e1	2.92		3.07	115.0		120.9
H	3.94		4.25	155.1		167.3
L	0.89		1.2	35.0		47.2

DIM.	mm			mils		
MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
A	1.4		1.6	55.1		63.0
B	0.44		0.56	17.3		22.0
B1	0.36		0.48	14.2		18.9
C	0.35		0.44	13.8		17.3
C1	0.35		0.44	13.8		17.3
D	4.4		4.6	173.2		181.1
D1	1.62		1.83	63.8		72.0
E	2.29		2.6	90.2		102.4
e	1.42		1.57	55.9		61.8
e1	2.92		3.07	115.0		120.9
H	3.94		4.25	155.1		167.3
L	0.89		1.2	35.0		47.2



P025H

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specification mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a trademark of STMicroelectronics

© 2003 STMicroelectronics – Printed in Italy – All Rights Reserved
STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco -
Singapore - Spain - Sweden - Switzerland - United Kingdom - United States.

<http://www.st.com>

